POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE (POES) OVERVIEW

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DRO Conference

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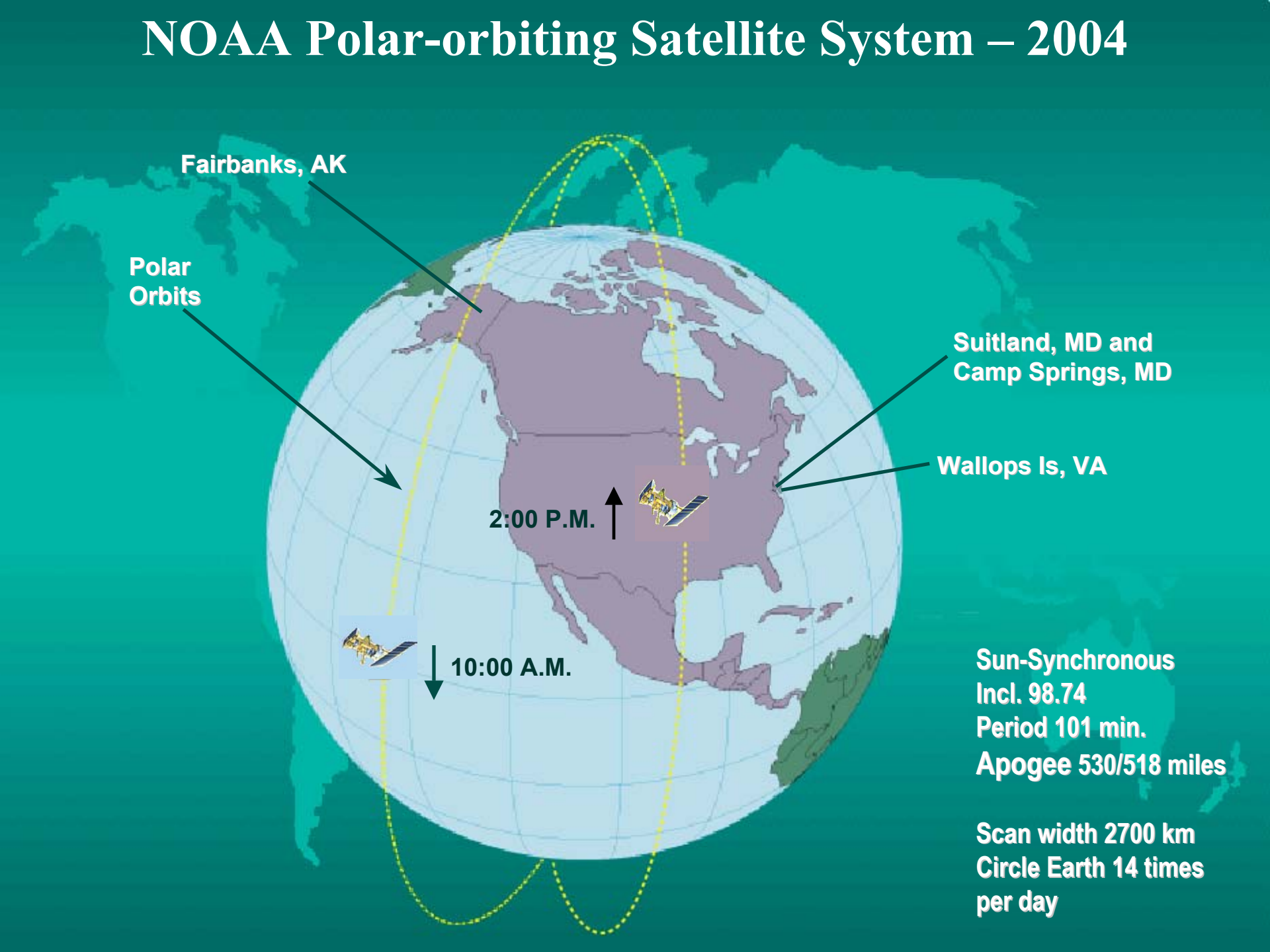
POES Mission

- **TO PROVIDE *UNINTERRUPTED* FLOW OF GLOBAL ENVIRONMENTAL INFORMATION IN SUPPORT OF OPERATIONAL REQUIREMENTS FOR:**
  - Global Soundings
  - Global Imagery
  - Global and Regional Surface & Hydrological Obs
  - Direct Readout, Data Collection, Search and Rescue
  - Space Environment and Ozone Observations
- **TO ESTABLISH LONG-TERM CONTINUOUS DATA SETS FOR:**
  - Climate monitoring and change predictions
- **This requires two satellites for continuous coverage placed in orbits selected to optimize support for both weather services and climate requirements**

NOAA Polar-orbiting Satellite System – 2004



Major Customers

- Direct Readout Users
  - High-resolution Picture Transmission (HRPT) Users
  - Automatic Picture Transmission (APT) Users
  - Search and Rescue
  - Data Collection System
- Numerical Weather Prediction Centers
- National Weather Service Field Offices
- NOAA Coast Watch and Ocean Watch
- Hazard community (US Forest Service)
- Other U.S. Federal Agencies
  - Dept of Defense
  - Dept. of Agriculture
  - Federal Aviation Administration (FAA) (Volcanic Ash)
- International community
- Global climate community

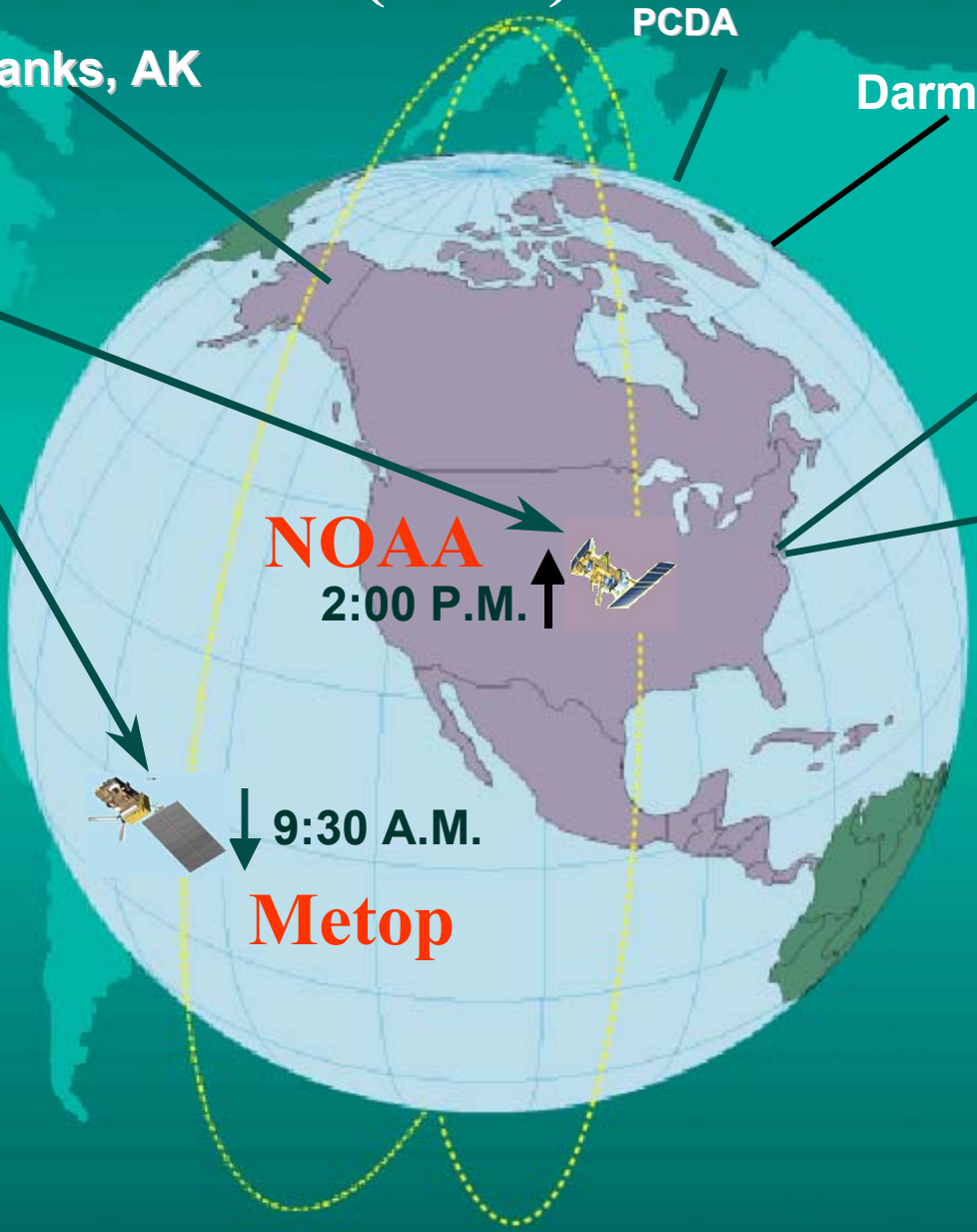
International Partners

- **EUMETSAT**
  - MetOp - (Initial Joint Polar System)
- **United Kingdom - UK Met Office**
  - Advanced Microwave Sounding Unit-B (Moisture) for NOAA-15, -16, -17
- **Canada - DND**
  - Search and Rescue - (SARR)
- **France - CNES**
  - Search and Rescue - (SARP)
  - Service ARGOS - (DCS & A-DCS)

Initial Joint Polar-orbiting System (IJPS)

- IJPS consists of two independent, but fully coordinated, polar satellite systems to provide for the continuous and timely collection and exchange of environmental data from space.
- Satellite systems are provided by:
  - NOAA - National Oceanic and Atmospheric Administration for the afternoon orbit
    - NOAA-N launch Mar 2005
    - NOAA-N' launch Dec 2007
  - EUMETSAT - European Organization for the Exploitation of Meteorological Satellites for the mid morning orbit
    - Metop 1 launch Dec 2005
    - Metop 2 launch 2010

Integrated Joint Polar-orbiting System (IJPS) - 2006



Sun-Synchronous
Incl. 98.7/98.9
Period 101 min.
Apogee 530/518 miles

Scan width 2700 km
Circle Earth 14 times
per day

IJPS

NOAA N & N'

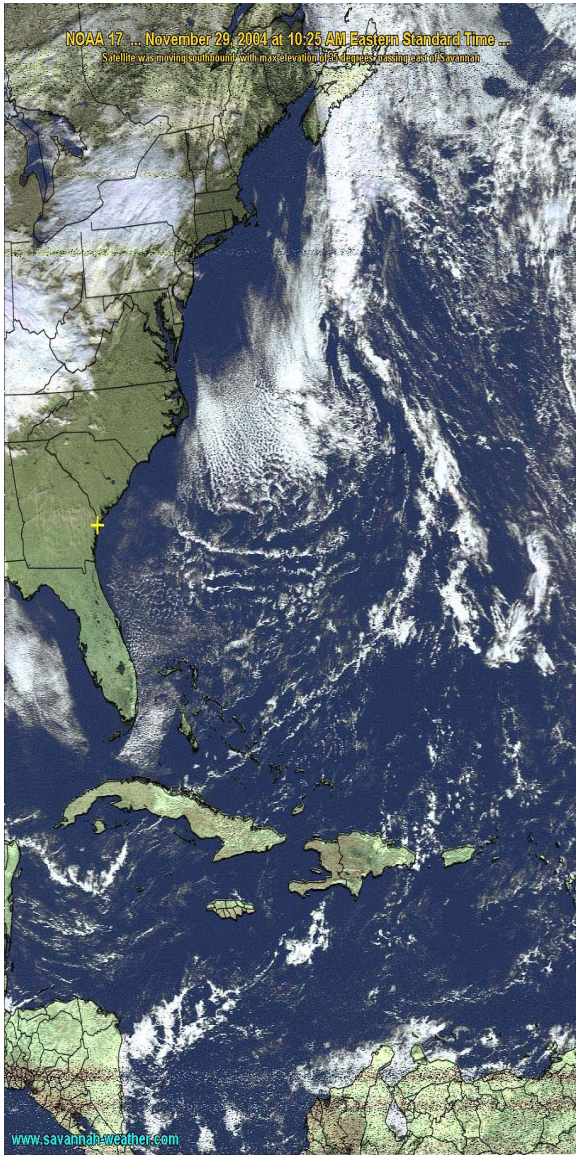
- 1400 Orbit -Ascending Node
- Direct broadcast with existing HRPT and analog APT links
- **Instruments**
  - NOAA Provided
    - AVHRR/3
    - HIRS/4
    - AMSU-A
    - SEM
    - SARSAT
  - EUMETSAT Provided
    - MHS
  - Argos (Data Collection Sys)
  - NOAA Unique
    - SBUV/2

METOP 1 &2

- 0930 Orbit - Descending Node
- Direct broadcast with M-HRPT and digital LRPT links
- **Instruments**
  - NOAA Provided
    - AVHRR/3
    - HIRS/4
    - AMSU-A
    - SEM
    - SARSAT
  - EUMETSAT Provided
    - MHS
  - Argos (Data Collection Sys)
  - EUMETSAT Unique
    - IASI
    - ASCAT
    - GOME-2
    - GRAS

Low Data Rate DRO Users

- POES Automatic Picture Transmission (APT)
  - Analog signal
  - 2 imagery channels at 4km
  - Frequency change for NOAA-N & N' -- reduce interference
    - 137.1 and 137.9125 MHz
  - On afternoon NOAA satellites until ~ 2012
  - On NOAA 15 and 17 until no longer optional
- Metop Low Rate Picture Transmission (LRPT)
  - Digital signal
  - 3 imagery channels at 1km & all other instrument data
    - Date compressed and can be encrypted
  - Flown on Metop morning orbits starting in 2006 and through ~ 2012

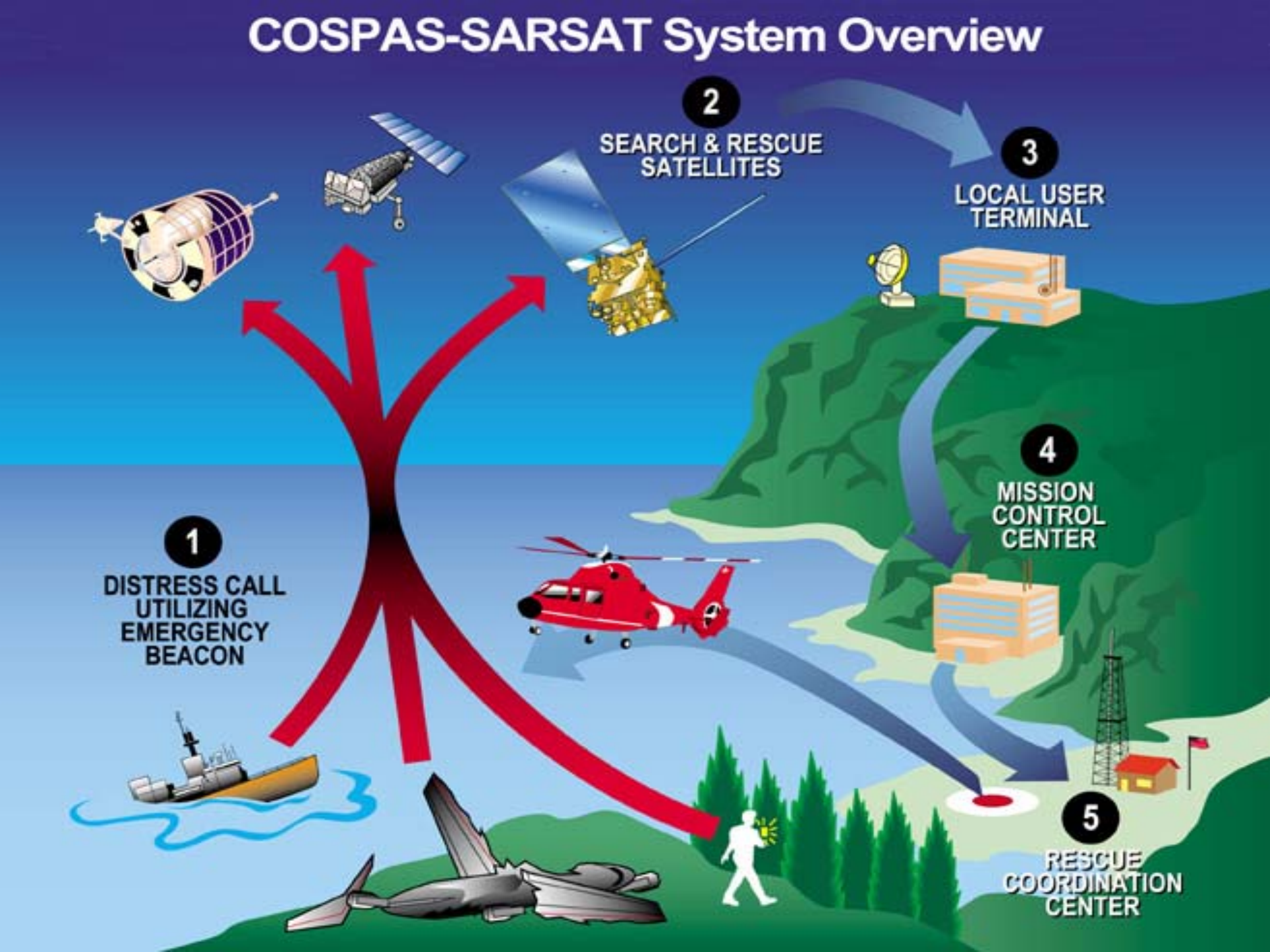


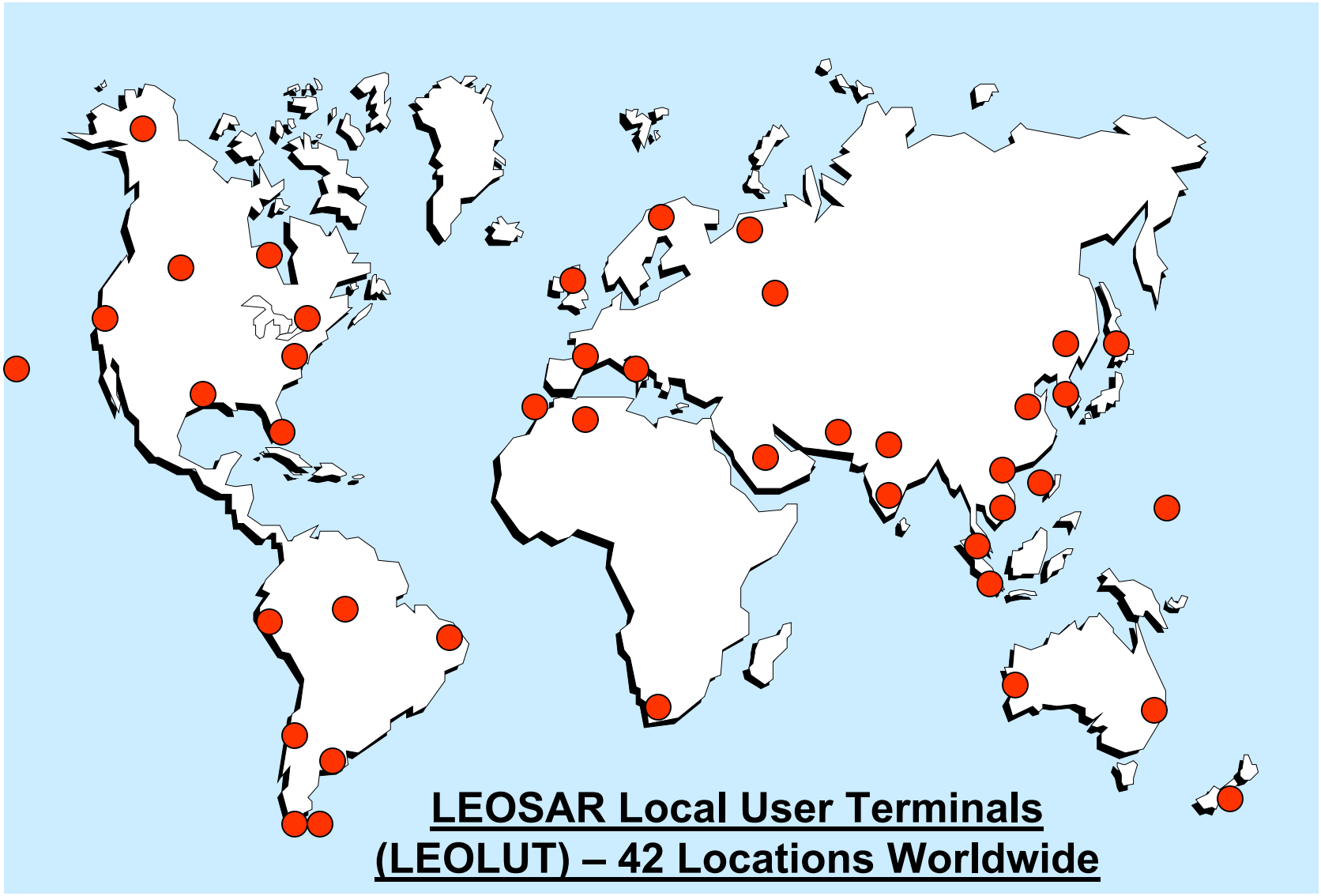
High Data Rate DRO Users

- POES High-resolution Picture Transmission (HRPT)
  - Realtime data at 667kbs rate
  - NOAA-N/N' instrument changes: MHS & HIRS/4
  - On afternoon NOAA satellite until ~ 2012
  - On morning NOAA satellite until ~ 2006
- Metop Advanced High-resolution Picture Transmission (A-HRPT)
  - Realtime data at 3.5mbs rate
  - Flown on Metop morning orbits from 2006-2012
  - All instrument data including European sensors (IASI, ASCAT, etc.)
  - Can be encrypted

Search & Rescue Satellite-Aided Tracking

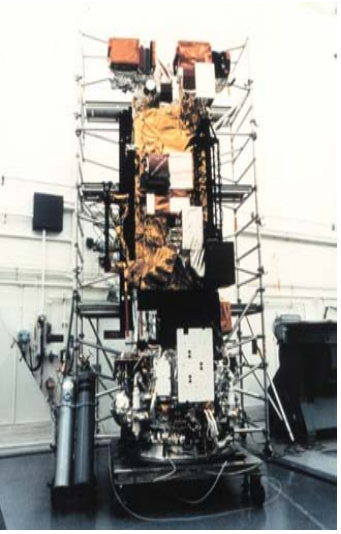
S A R S A T


COSPAS-SARSAT System Overview
2
SEARCH & RESCUE SATELLITES
3
LOCAL USER TERMINAL
4
MISSION CONTROL CENTER
1
DISTRESS CALL UTILIZING EMERGENCY BEACON
5
RESCUE COORDINATION CENTER


LEOSAR Local User Terminals
(LEOLUT) – 42 Locations Worldwide

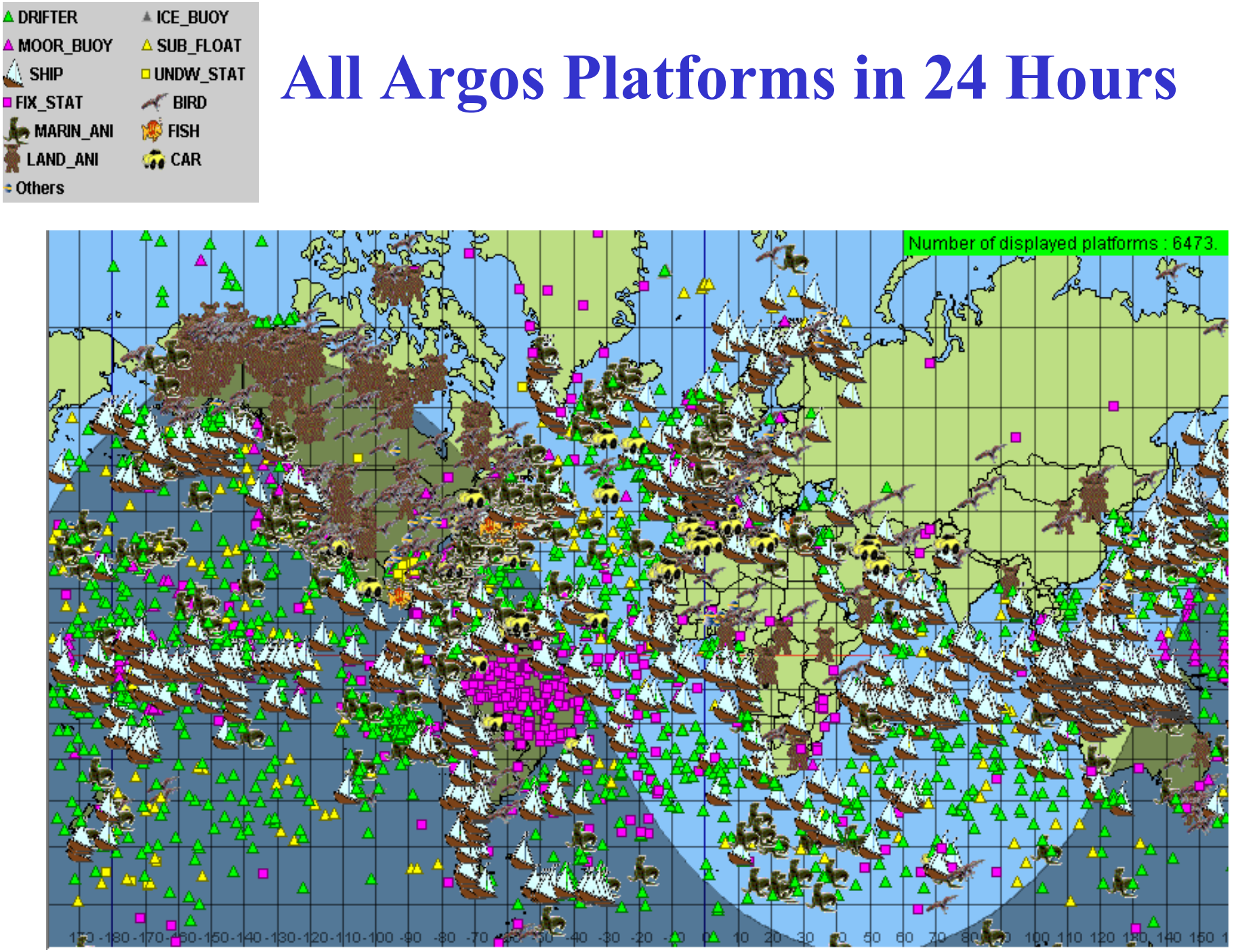

Mission Control Centers
(MCC) – 25 Locations

Argos Data Collection System



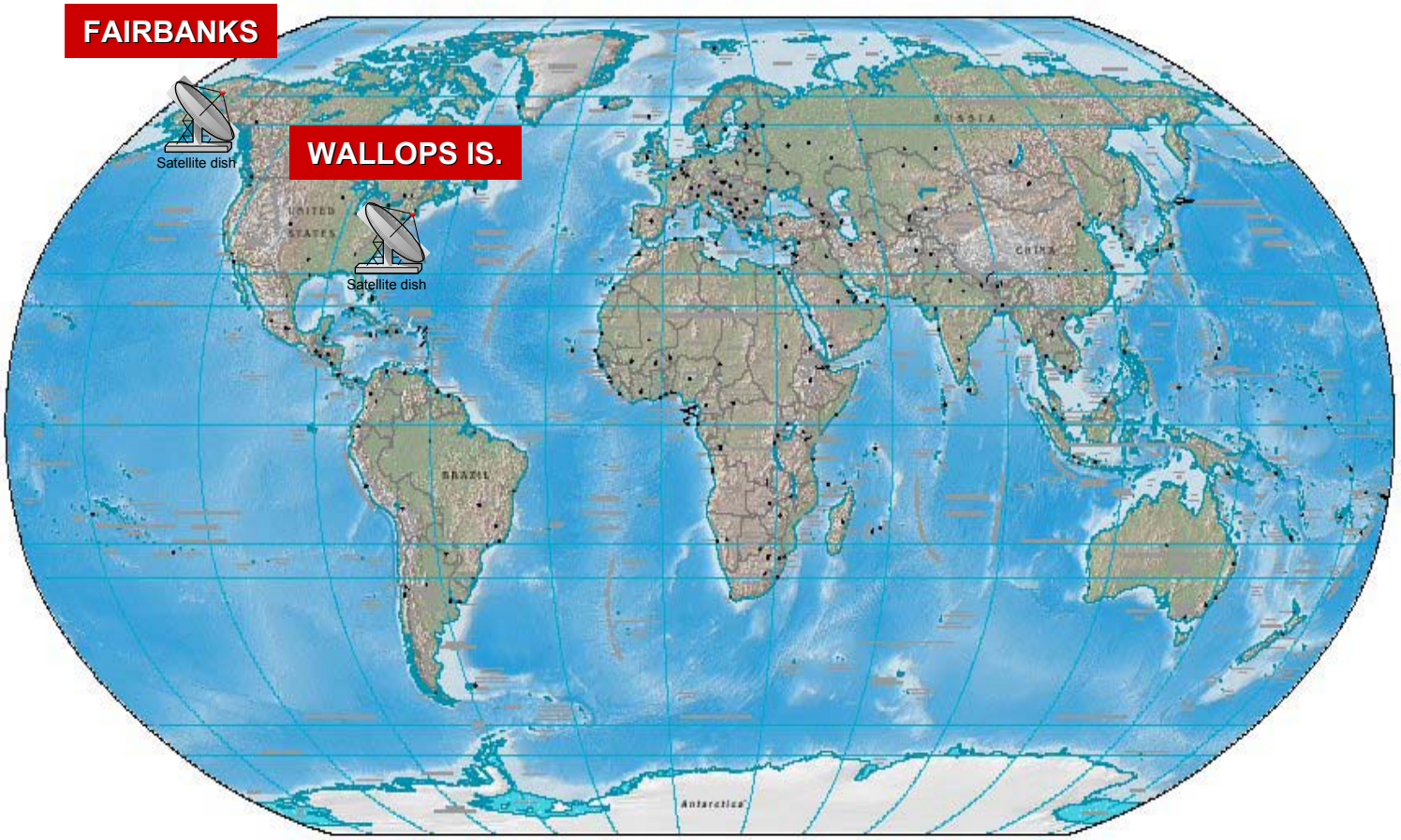
- NOAA and CNES cooperative program since the early 1970's
- Developed to fill technological need for scientific data retrieval
- Oversight by Argos Operations Committee (OPSCOM) co-chaired by NOAA and French Space Agency (CNES)
- NOAA responsible for:
  - Spacecraft integration, launch and operation
  - Providing access to global pre-processed data stream
- CNES responsible for:
  - Providing Argos instrument
  - Operation of Argos data processing system

All Argos Platforms in 24 Hours

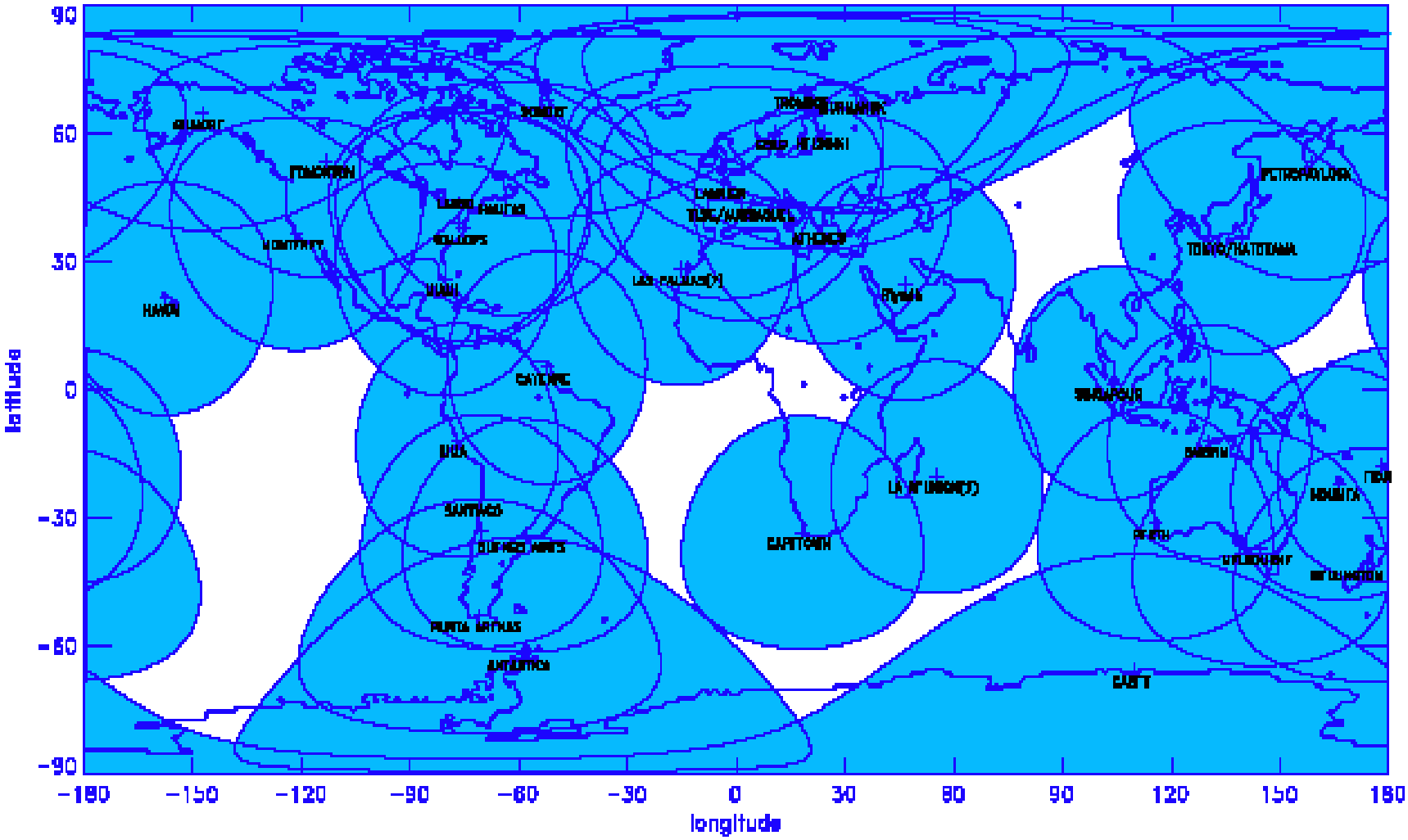


GROUND RECEIVING STATIONS

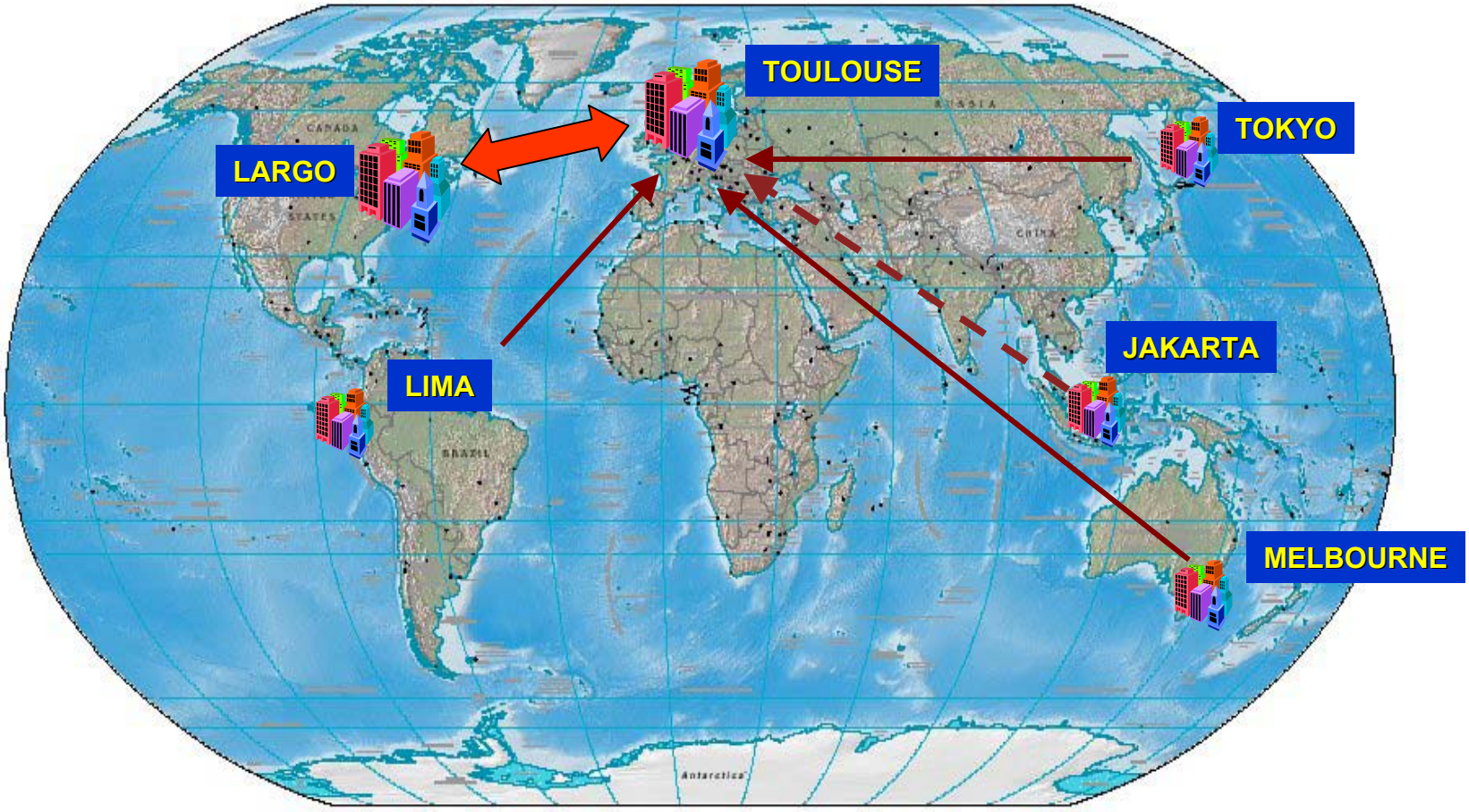
➢ GLOBAL



REGIONAL STATION COVERAGE



ARGOS PROCESSING CENTERS



POES Planned System Coverage